

B. AMENDMENTS TO THE CLAIMS

Claims 1-76 (cancelled)

Claim 77 (currently amended): A component transfer system for transferring at least one electrical component to be placed on a substrate, wherein the component has a superficial fiducial marker on a surface of the component and wherein the fiducial marker indicates an orientation of a plurality of leads protruding from the component, said component transfer system comprising:

a component feed source supporting the at least one component;

a component transfer mechanism oriented to retrieve the at least one component from the component feed source and place a retrieved component in a transferred area such that the fiducial marker on said component is visible for detection prior to retrieval from said component feed source and placement of said retrieved component on the substrate;

an optical fiducial marker detector oriented to detect the fiducial marker on said component prior to retrieval from said component feed source and placement of said retrieved component on the substrate and generate alignment data for said retrieved component, said alignment data representing lead orientations for said component; and

a controller coupled to said fiducial marker detector for receiving said alignment data therefrom for said retrieved component and containing instructions which, when executed, cause said controller to compare said alignment data for said retrieved component to desired alignment data indicative of desired lead orientations, said controller sending realignment signals to said component transfer mechanism for said retrieved component wherein the alignment data

therefore differs from said desired alignment data to cause said component transfer mechanism to realign said retrieved component when the alignment data therefore differs from the desired alignment data.

Claim 78 (previously presented): The component transfer system of claim 77 wherein the component transfer mechanism comprises a pick and place machine.

Claim 79 (previously presented): The component transfer system of claim 78 wherein said pick and place machine comprises:

- a pick spindle having a plurality of placement heads; and
- a placement spindle having a plurality of placement heads.

Claim 80 (previously presented): The component transfer system of claim 77 wherein said component feed source comprises a continuous track of trays operably supported by continuous tape reels.

Claim 81 (previously presented): The component transfer system of claim 77 wherein said component feed source comprises a source of components and at least one serial feed track extending from said component feed source to said component transfer mechanism.

Claim 82 (currently amended): A component transfer system for transferring at least one electrical component to be placed on a substrate, wherein the component has a superficial fiducial marker on a surface of the component and wherein the fiducial marker indicates an orientation of a plurality of leads protruding from the component, said component transfer system comprising:

- a component feed source supporting the at least one component;

a component transfer mechanism oriented to retrieve the at least one component from the component feed source and place a retrieved component in a transferred area such that the fiducial marker on said component is visible for detection prior to retrieval from said component feed source and placement of said retrieved component on a substrate;

an optical fiducial marker detector oriented to detect the detectable location of the fiducial marker on said component prior to retrieval from said component feed source and placement of said retrieved component on a substrate and generate alignment data for said retrieved component, said alignment data representing lead orientations for said component; and

a controller coupled to said fiducial marker detector for receiving said alignment data therefrom for said retrieved component and containing instructions which, when executed, cause said controller to compare said alignment data for said retrieved component to desired alignment data indicative of desired lead orientations, said controller sending realignment signals to said component transfer mechanism for said retrieved component wherein the alignment data therefore differs from said desired alignment data to cause said component transfer mechanism to move said retrieved component to a discard area when the alignment data therefore differs from the desired alignment data.

Claim 83 (previously presented): The component transfer system of claim 82 wherein the component transfer mechanism comprises a pick and place machine.

Claim 84 (previously presented): The component transfer system of claim 83 wherein said pick and place machine comprises:

a pick spindle having a plurality of placement heads; and
a placement spindle having a plurality of placement heads.

Claim 85 (currently amended): A component transfer system comprising:

 a plurality of electrical components for placement on one or more substrates, each component having two sides that are substantially parallel to each other and that each have an equivalent number of leads protruding therefrom, and wherein each component has a first marker on a surface of the component and wherein the first marker superficially alters a physical appearance of the component to indicate a predetermined orientation of the leads, said plurality of components supported in a component feed source;

 a pick and place machine oriented to retrieve a component from the feed source and place a retrieved component in a transfer area such that the fiducial marker is visible for detection prior to retrieval from said component feed source and placement of said retrieved component on a substrate;

 an optical marker detector oriented to detect the marker on the component prior to retrieval from said component feed source and placement of said retrieved component on a substrate and generate alignment data that is indicative of the position of the marker within the transfer area, said alignment data representing lead orientations for said component; and

 a controller in communication with said marker detector for receiving said alignment data therefrom and containing instructions which, when executed by the controller, cause the controller to compare the alignment data received from the marker detector and compare it to predetermined alignment data to ascertain whether the retrieved component is correctly aligned within the transfer area.

Claim 86 (previously presented): The system of claim 85, further comprising a continuous serial track extending from said component feed source to said pick and place machine.

Claim 87 (previously presented): The system of claim 86, further comprising a plurality of component trays serially disposed along the continuous serial track

Claim 88 (previously presented): The system of claim 85, wherein each component has a second marker on the surface of the component, wherein the second marker indicates the predetermined location of the leads.

Claim 89 (previously presented): The system of claim 85, wherein the marker detector is directed toward the feed source and has a signal output associated with the predetermined orientation of the leads.

Claim 90 (previously presented): The system of claim 85, wherein the pick and place machine comprises:

a pick spindle having a plurality of pick heads; and
a placement spindle having a plurality of placement heads.